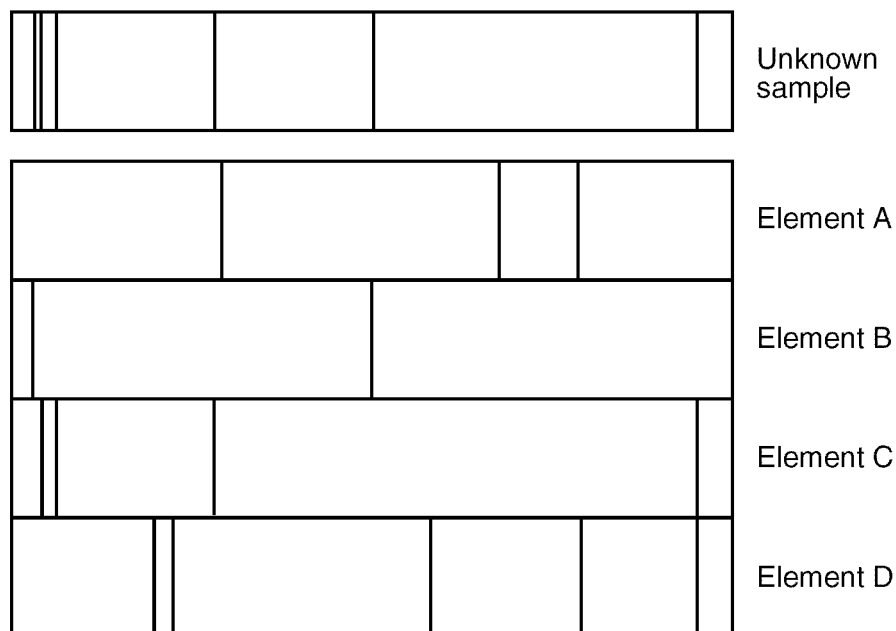


Atomic Energy Levels

1. If a hydrogen atom absorbs 1.89 eV of energy, it could be excited from energy level
 - 1) $n = 1$ to $n = 2$
 - 2) $n = 1$ to $n = 3$
 - 3) $n = 2$ to $n = 3$
 - 4) $n = 2$ to $n = 4$
2. What is the minimum amount of energy required to ionize a hydrogen atom in the $n = 2$ state?
 - 1) 13.6 eV
 - 2) 10.2 eV
 - 3) 3.4 eV
 - 4) 0 eV
3. A photon having an energy of 15.5 electron volts is incident upon a hydrogen atom in the ground state. If the photon is absorbed by the atom, it will
 - 1) ionize the atom
 - 2) excite the atom to $n = 2$
 - 3) excite the atom to $n = 3$
 - 4) excite the atom to $n = 4$
4. Photons incident upon hydrogen atoms in the $n = 2$ level raise the energy of the atoms to the $n = 4$ level. What is the energy of the incident photons?
 - 1) 1.89 eV
 - 2) 2.55 eV
 - 3) 3.40 eV
 - 4) 4.25 eV
5. An electron in a hydrogen atom drops from the $n = 3$ energy level to the $n = 2$ energy level. The energy of the emitted photon is
 - 1) 1.51 eV
 - 2) 1.89 eV
 - 3) 3.40 eV
 - 4) 4.91 eV
6. Which type of photon is emitted when an electron in a hydrogen atom drops from the $n = 2$ to the $n = 1$ energy level?
 - 1) ultraviolet
 - 2) visible light
 - 3) infrared
 - 4) radio wave
7. Compared to the amount of energy required to excite an atom in the ground state, the amount of energy released by the atom when it returns to the ground state is
 - 1) less
 - 2) greater
 - 3) the same
8. The lowest energy state of an atom is called its
 - 1) ground state
 - 2) ionized state
 - 3) initial energy state
 - 4) final energy state
9. As excited electrons in hydrogen atoms return to the ground state, they emit
 - 1) electrons
 - 2) protons
 - 3) photons
 - 4) neutrons

Atomic Energy Levels

10. The diagram below represents the bright-line spectra of four elements, *A*, *B*, *C*, and *D*, and the spectrum of an unknown gaseous sample.



Based on comparisons of these spectra, which two elements are found in the unknown sample?

- 1) *A* and *B*
- 2) *A* and *D*
- 3) *B* and *C*
- 4) *C* and *D*

11. If an orbiting electron falls to a lower orbit, the total energy of that atom will

- 1) decrease
- 2) increase
- 3) remain the same

Atomic Energy Levels
Answer Key

1. 3

2. 3

3. 1

4. 2

5. 2

6. 1

7. 3

8. 1

9. 3

10. 3

11. 1
